



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

CULTURES OF HETEROECIOUS RUSTS,

1920-21

W. P. FRASER

A few culture experiments made in 1920 and 1921 seem worth recording, as they extend the aecial host range of *Puccinia subnitens* Diet., the well-known pluriverous rust. They also clear up the confusion that has prevailed in regard to the connections of the aecia on *Glaux maritima* L.

Telial inoculations were made by suspending germinating telia above the potted host plants which had been sprayed with water by an atomizer. The plants were placed in an infection box for about 48 hours and then removed to the greenhouse. In every experiment several checks were kept which remained free from infection.

PUCCINIA DISTICHLIDIS Ellis & Ev.

Aecia were found to be locally abundant on *Glaux maritima* L. near Saskatoon in the spring of 1920. Field observations left little doubt that they were connected with *Puccinia Distichlidis* on *Spartina pectinata* Bosc. Telial material on this host was collected and gave excellent germination. Inoculations were made in the greenhouse on two pots of *Glaux maritima*. Pycnia developed on both, followed by abundant aecia. The experiments were repeated in 1921, on May 27, on two pots of *Glaux maritima*. Pycnia and aecia followed in abundance. Inoculations of a third pot on June 2 were also successful. Dr. Arthur studied the material from the field collections and cultures of 1920, and as a result has listed *Glaux maritima* as an aecial host of *P. Distichlidis*. (See N. A. F. 7: Part 4, 317.)

Arthur (Mycol. 8: 136. 1916; 9: 299. 1917) has shown that *Puccinia Distichlidis* on *Spartina Michauxiana* Hitchc. has aecia also on *Stieronema ciliatum* (L.) Raf. Field observations made at Brandon, Man., indicate that this is also true in western Canada. This culture adds another host species to that established by Arthur.

Plowright in 1890, using telial material of *Uromyces Scirpi* Burr. from *Scirpus maritimus* L. in England, successfully infected *Glaux maritima*. This work has not been confirmed in America, but American aecia in *Glaux* have been referred to that species. This experiment and the one described below shows that aecia on *Glaux* may belong to *P. Distichlidis* or *P. subnitens*.

UROMYCES ALOPECURI Seym.

Inoculations were made on a pot of *Alopecurus aristulatus* Michx. with aeciospores from aecia on *Ranunculus apetalus* Farr, collected by Mr. A. McNeil. Uredinia and telia followed. This confirms the results of cultures in 1918. (See Mycol. 11: 129. 1919.)

PUCCINIA SUBNITENS Diet.

Field observations near Saskatoon in 1920 indicated that aecia on *Glaux maritima* were connected with *Puccinia subnitens* or *Distichlis stricta* (Torr.) Rydb. Inoculations with germinating teliospores were made on two pots of *Glaux maritima* on June 26. Pycnia appeared in about a week, and were followed by abundant aecia. The experiments were repeated in 1921. Inoculations were made on different potted plants on May 27, June 2 and 9. Heavy infection followed in all the plants inoculated, both pycnia and aecia developing abundantly. Inoculations on *Dodecatheon pauciflorum* (Durand) Greene failed to produce infection.

Aecia from the cultures and field collections of 1920 were sent to Dr. Arthur, who was then preparing the manuscript of *North American Flora* covering the heteroecious grass rusts. He studied the field collections and the cultures of aecia and reported that they agreed in every respect with those of *P. subnitens*, and pointed out that the outer walls of the peridial cells were much thickened as in the typical aecia of *P. subnitens*. In this respect they differed markedly from the aecia on *Glaux* belonging to *P. Distichlidis*. He listed the field collections on *Glaux* from Saskatchewan under *P. subnitens* Diet. (*Dicaeoma Sarcobati* (Peck) Arth.). (See N. A. F. 7: Part 4, 305.)

The aecia of *P. subnitens* on *Glaux* were long and slender and differed in this respect from the aecia of *P. Distichlidis* on the

same host, which developed under exactly the same conditions in the greenhouse. The latter were short and cupulate and much paler in color. The field collections also showed the same differences.

Observations in 1920 and 1921 in the same region also indicated the connection of aecia on *Plantago eriopoda* Torr. with *Puccinia subnitens* on *Distichlis stricta* (Torr.) Rydb. Inoculations were made on three pots of *Plantago eriopoda* on May 27. Heavy pycnial infections appeared on all the plants, followed by aecia. The aecia showed the characters of *Puccinia subnitens*, the outer wall of the peridial cells being much thickened. The aecia were not so long as those of *P. subnitens* on *Glaux maritima* grown in the greenhouse at the same time and under the same conditions, nor was the production of aecia so abundant.

Many cultures by Arthur and by Bethel (Phytopath. 7: 92. 1917; 9: 193. 1919) have shown that *P. subnitens* is a species with a large number of aecial hosts in many families. Arthur, in the *North American Flora*, lists twenty-one families (including *Glaux maritima*). These experiments have added two new families to the list of aecial hosts. Arthur (Mycol. 9: 306. 1917; Bot. Gaz. 25: 17. 1903) has shown that *Uromyces seditiosus* on *Aristida* has aecia on several species of *Plantago*. These experiments show *P. subnitens* also has aecia on *Plantago eriopoda*.

SUMMARY OF NEW RESULTS

Puccinia Distichlidis Ellis & Ev. Inoculations with teliospores from *Spartina pectinata* Bosc. produced pycnia and aecia on *Glaux maritima* L.

Puccinia subnitens Diet. Inoculations with teliospores from *Distichlis stricta* (Torr.) Rydb. produced pycnia and aecia on *Glaux maritima* L. and *Plantago eriopoda* Torr., but failed to infect *Dodecatheon pauciflorum* (Durand) Greene.

SUMMARY OF RESULTS CONFIRMING PREVIOUS WORK

Uromyces Alopecuri Seym. Inoculations with teliospores from *Ranunculus apetalus* Farr infected *Alopecurus aristulatus* Michx.

DOMINION LABORATORY OF PLANT PATHOLOGY,
UNIVERSITY OF SASKATCHEWAN,
SASKATOON, SASK.